

BASF Aktiengesellschaft

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We claim:-

- 5 1. A process for the preparation of a catalyst containing passivated copper and zinc oxide and/or alumina by
- 10 (1) precipitating a mixture of catalyst precursor components dissolved or suspended in a diluent with anion-containing precipitating agents, washing and drying to form a solid catalyst precursor in the form of powder or granules,
- 15 (2) calcining the solid catalyst precursor obtained in stage (1) to an anion content from the precipitating agent of from 0.1 to 2.5% by weight and
- 20 (3) shaping and, if required, reducing and passivating the calcined catalyst precursor from stage (2) in any desired order to form the catalyst.
- 25 2. A process as claimed in claim 1, wherein, in stage (3), the calcined catalyst precursor from stage (2) is first reduced, then passivated and then subjected to the shaping process.
- 30 3. A process as claimed in claim 1, wherein the catalyst contains alumina in addition to copper and zinc oxide, and solutions of zinc, aluminum and copper salts are precipitated simultaneously or in any desired order in stage (1).
- 35 4. A process as claimed in claim 1, wherein the precipitation in stage (1) is carried out by adding carbonates and the carbonate content is determined as  $\text{CO}_3$ .
5. A process as claimed in claim 1, wherein stage (1) is carried out as follows:
- (a) precipitating a solution of zinc and aluminum salts, the atomic Zn : Al ratio being 3 : 1 - 1 : 3, with an alkali metal carbonate solution at

a pH of from 5 to 12 and at from 20 to 100°C,

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- (b) separating off and washing the precipitate to remove alkali metal ions,
  - (c) drying the precipitate,
  - (d) calcining the precipitate at from 250 to 800°C to give a mixed oxide,

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- (e) dispersing the mixed oxide in an acidic solution of copper and zinc salts, the atomic Cu : Zn ratio of the solution being from 1 : 5 to 20 : 1,

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- (f) precipitating the dispersion with an alkali metal carbonate solution at a pH of from 6 to 9 and at from 20 to 100°C,

- (g) carrying out steps (b) to (d),

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it being possible for the solutions in steps (a) and/or (e) additionally to contain salts or oxides of one or more elements of the platinum metals of groups 4, 5 and 11 and of the lanthanides of the Periodic Table of the Elements or for the salts or oxides to be applied to the mixed oxides.

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6. A catalyst obtainable by a process as claimed in claim 1.

7. A process for the steam reforming of methanol by reacting methanol and water over a catalyst as claimed in claim 6 at from 0.5 to 10 bar and at from 150 to 450°C.

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8. A process for CO conversion with water to form CO<sub>2</sub> and hydrogen, wherein the reaction is carried out over a catalyst as claimed in claim 6.

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9. A process for reducing the volume shrinkage to less than 5% during the operation of catalysts, wherein the catalyst is prepared by a process as claimed in claim 1.